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TRAINING CADRES FOR OPERATION AND/MAINTENANCE OF POWER INSTALLATIONS

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Sub-Item A.4.3.4:

Training Cadres for Operation & Maintenance of Power Installations

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1. It is no small problem today having to maintain power installations in a fast developing country like Nigeria. There are clearly three handicaps which must be overcome if continuous supply of power is to be maintained in order to promote industrial growth and expansion. New uses for long service illiterate employees must be found and the efficiency of older employees improved. The best use of unskilled labour must be made and the difficulty of a lack of an industrial or technological background of the effective labour force as a whole must be overcome.

2. There was no formal provision for the instruction and training of new entrants into the electricity industry. An employee was invariably taken on at the bottom of the status scale as general labourer and from then on his vertical progress depended entirely on him. As a general labourer he was attached to an artisan and his job was "fetching, carrying and holding" of tools, gadgets and ladders. The artisan was careful that no one acquired his skill too rapidly or too easily and he was jealous to keep himself in the saddle as boss as long as he could.

3. Those on whom the training of personnel devolved were often men who had started their career in the industry as labourers and who had risen to artisan grades after many years of unorganised training. This does not mean that excellent human material has not been available to the power industry: there are highly skilled men who have run the smaller undertakings with excellent results. Where most of these fail is when a situation arises in which a technical problem is involved. They lack an analytical mind.

4. It is not unusual for linesmen and even technicians to report that the regular fault on a distribution network was due to defective line

materials when the cause may be something else. This is clearly a case of wrong diagnosis. It is quite clear therefore that in the process of developing industries in a young country like Nigeria the unplanned method of training staff for the operation and maintenance of power installations and systems does not meet the needs of the time.

5. There are clearly four classes of workers to be considered - the general labourer, the artisan or craftsman, the supervisor and the technician. In a developing country none of these has any appreciable technical or industrial background and, except for the technician or assistant technical officer, who is better educated, most of the others may have little or no primary school education.

6. The training of the labourer is too often overlooked as being unimportant. This class of worker requires some introduction to the rules and regulations governing the safety of all persons working in the electricity supply industry. It is therefore a useful investment on the part of the employer to give some kind of instruction to labourers.

7. Labourers often think that misplaced enthusiasm which defies safety rules would win the approval of their superiors. It is a good thing therefore to arrange as early as possible after the engagement of a group of labourers a course of instruction on safety. All employees in generating stations or on distribution should be made to attend safety classes.

8. The artisan class is indeed a peculiar class of workers with ideas contrary to known facts and practices in the performance of their duties. This is particularly so on distribution where the linesman is very much exposed to the danger of live overhead conductors. It is not unusual for him to go up a pole and test with his bare fingers if the low voltage line is dead even though he has his test lamp with him!

9. Many artisans exist in the industry who can barely sign their names let alone read and write. Written instructions should therefore be read and interpreted to them several times until these are properly understood. Even with those persons having some primary school education much difficulty is experienced in the understanding of technical instructions. Important directives should be thoroughly explained to all from the grade of artisans mates upwards, and care should be taken to see that all ambiguities are explained because the greatest single cause of inefficiency on the part of these employees is their inability to read and understand instructions.

10. Constant repetition of important instructions is advisable for all staff until a habit has been formed in carrying them out. There are many occasions when there is no point in asking a fitter to carry out a certain operation when he lacks confidence. He will sooner or later acquire confidence and skill in carrying out future assignments of similar nature only when his superior officer takes the trouble to do part of the work with him. The Electricity Corporation of Nigeria realised the importance of training personnel a few years ago and embarked upon the systematic training of power station and distribution staff.

11. Above the artisan is the supervisor who is normally promoted from among deserving artisans and to him is delegated the work of supervising the men on the job. The level of intelligence of the artisan and the supervisor groups has always been about equal and this has resulted in the poor quality of the supervision.

12. A mechanical tradition is only in its infancy in most of Africa and it is not surprising therefore that some of our artisans even after years on the job are occasionally prone to poor performance because of their social and environmental background. To some extent therefore the supervisor has been a glorified artisan whose place is nevertheless important in the electricity supply industry because his status is acquiring some significance as the demand for electricity grows with the development of industries. It is therefore clear that the method of training which requires general labourers to help themselves up the labour scale will not produce the proper men to operate and maintain power installations.

13. The technician grade consists of young men with some secondary school education who have undergone a course of study at a technical institute. Technician training in the past was limited in scope because the field of endeavour was rather small and unambitious. The Public Works Department of the Government was then the only employer and since electricity was at best a rural supply industry it was an insignificant section of that department.

14. The handicaps to the proper development of technical skill were many and included not only the social background of the men as has already been mentioned but also the absence of a national political awareness in pre-independence days. In effect therefore the junior and senior engineering assistants in the past were but glorified fitters, linesmen, and handimen as far as electricity was concerned.

15. The training of older hands is a difficult task bordering at times on the impossible because of their set attitudes to new changes. Refresher courses of a few days or weeks duration are ideal. It is important that all those attending should be aware that they are not attending school as such but are meeting to discuss mutual problems and to investigate new ideas for the furtherance of their efficiency in the industry.

16. The content of such courses should relate to the work the men are already engaged on and the talks should not be of a very high technical nature. These courses must be downright practical and the instructors should use language the men will readily understand. The men should be encouraged to take active part in the discussions which follow and it is advisable to have small discussion groups. Taking part in a general discussion gives them the feeling of "belonging" and of being regarded as responsible grown ups.

17. Refresher courses should provide drawings, sketches and pictures so that important points could be better impressed on the minds of those attending. Films are ideal and should be used if available. It should be remembered that for most of those attending such courses the standard of education will be of the primary education level and care is therefore required in the planning of the talks for discussion. Wherever possible, some practical demonstration should be given by those attending and also by the instructor. A certificate showing that he attended the course should be awarded each participating employee on completing the course.

18. The first realistic move to train staff was launched in 1957 and the first set of men taken on were drawn from the industry, men from power stations and distribution. These men were trained to be supervisors in the Corporation's training school. They were instructed in power station practice, both steam and diesel, and those who later chose distribution as their specialty were taught distribution fundamentals and practice in greater detail.

19. In the training school all the craft apprentices receive a one year basic instruction in general workshop practice - measurements, calculations, drawing, drilling, filing, turning, machining, milling, soldering and brazing and simple fitting. English is also taught. In the second year the boys are divided into two distinct groups - mechanical and electrical - and they continue to receive appropriate instructions. Although specialisation starts in the second year the groups have certain

instructions in common so that, for example, the mechanical fitter is not entirely ignorant of electrical maintenance or the electrical man at a loss in a power station. In the third year the apprentices are sent to a large power station and also to a large undertaking for their practical training.

20. During the third year the mechanical craft boys move from section to section in the power station and this, apart from giving them the requisite practical aspect of their training, also helps them to decide later on what jobs they would like to do. Thus they can choose to be any of the following - plant operator (engine or turbine driver), auxiliary plant attendants, control room operator and maintenance fitter. At the end of the third year the boys should have developed confidence in themselves and be able to tackle any job assigned to them when they are eventually absorbed into the industry. These boys are able to direct subordinate staff and they are resourceful and ambitious.

21. The formal training of craftsmen must be more fully developed. The E.C.N. has found that the boys admitted for training must have a minimum of secondary modern or secondary grammar school (class 4) education but not the General Certificate of Education or the West African School Certificate. During the next two years after their formal training the boys develop more quickly because they realise they have to make their full contribution as craftsmen.

22. For the training of technicians or assistant technical officers, the boys who must have either the West African School Certificate or the General Certificate of Education at ordinary level are sent to the various government sponsored technical institutions where they take sandwich courses in electrical or mechanical engineering leading to the award of the Ordinary Certificate of the City and Guilds and or the approved certificate of the college. The electricals after training are employed on the operation and maintenance of distribution systems while the mechanicals are drafted to power stations where they act as senior operator - supervisors, assistants to shift engineers or maintenance engineers.

23. The Electricity Corporation of Nigeria has plans for expanding its training schemes and looks forward to the time when all its craftsmen will be educated men who have passed through its training school.

514 E - Oct. 1962 - 1,600